ABSTRACT OF THE DISCLOSURE

A catalyst includes a cyclic imide compound having an N-substituted cyclic imide skeleton represented by following Formula (I):

$$\begin{array}{c}
0 \\
C \\
N = X \\
0
\end{array}$$
(1)

wherein X is an oxygen atom or a hydroxyl group, and having a solubility parameter of less than or equal to 26 [(MPa)^{1/2}] as determined by Fedors method. The catalyst may further comprise a metallic compound. By allowing (A) a compound capable of forming a radical to react with (B) a radical scavenging compound in the presence of the catalyst, an addition or substitution reaction product between the compound (A) and the compound (B) or a derivative thereof can be obtained.